CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36502

Project Title

Is It Possible to Generate Electricity from Waste Water?

Abstract

Objectives/Goals

￼￼The objective of this study was to determine whether electricity could be generated from waste water.

Methods/Materials

To create electricity, I had to construct a microbial fuel cell. I made the anode and cathode chambers by purchasing two air-tight containers. To connect the two chambers I made an agar salt-water bridge in a PVC pipe. In order to complete the circuit, I had to make two electrodes of carbon fiber sewn to a loop of copper wire. Two alligator cables attached a resistor were clamped to each electrode. The anode chamber contained about a pint of microbe-rich silt and organic matter from the Benthic zone of the San Joaquin River and the cathode chamber contained river water with air delivered by an aquarium pump. Electricity was measured by a multimeter whose leads were in contact with the resistor.

Results

On Days 1 and 2, no electricity was generated. Days 3-9 demonstrated increasing electricity measurements up to 15.7 millivolts. Days 10-14 demonstrated decreasing amounts of electricity.

Conclusions/Discussion

Electricity can be generated from waste water - even the relatively clean sand-rich silt of the San Joaquin River. To be able to take only a pint of wastewater and haveit conduct 15.7 millivolts is pretty amazing. That means that 8 gallons of it can produce 1 volt, and about 3.5 volts can power and LED light bulb. Today, we do not really have a sufficient method of purifying wastewater so that we can drink it safely. Even if this was created, would anybody really want to take the risk that it might result with a disease? Instead, people would be much safer if they used wastewater to conduct electricity. If America had a system that could convert waste into electricity, it would definitely boost our nation#s economy as well as create job openings.

Summary Statement

I demonstrated that electricity can be generated from wastewater using a microbial fuel cell.

Help Received

My advisor provided me with the list of materials and a guide on how to build a fuel cell. I built the fuel cell under the supervision of my father.

Preliminary